

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Withdrawn-Currently Amended) A method of forming a vibration damping coating on a metallic substrate comprising applying to a surface of the metallic substrate by plasma spraying a coating comprising a spinel having regions of ~~relative oxide or nitride imbalance~~ oxide or nitride that vary from a stoichiometric spinel ratio, or regions of oxide and nitride that vary from a stoichiometric spinel ratio; said spinel further comprising calcium oxide; and said spinel further ~~characterised by the presence of~~ comprising at least about 85,000 effective interface and defect zones per square millimetre, or at least about 100,000 orientated grain boundaries and microcracks per square millimetre, or both.
2. (Withdrawn) A method according to claim 1, wherein the metallic substrate comprises a titanium alloy.
3. (Withdrawn) A method according to claim 1, wherein the spinel includes a molar excess of one of the oxides on which the spinel is based.
4. (Withdrawn) A method according to claim 1, wherein the molar excess of the oxide is within about 7% of equimolar.
5. (Withdrawn) A method according to claim 1, wherein the spinel includes at least one introduced nitride and/or oxide.
6. (Withdrawn) A method according to claim 5, wherein the introduced oxide and/or nitride is selected from nitrides and oxides of: zirconium, yttrium, silicon, aluminium, calcium, titanium, boron, hafnium, tungsten, nickel, niobium, iron, chromium, titanium, vanadium, manganese, molybdenum, cerium, cobalt, barium, praseodymium, neodymium, samarium, gadolinium, erbium and strontium.

7. (Withdrawn) A method according to claim 5, wherein the introduced nitride and/or oxide is present in an amount up to about 40% by total weight of the coating material.

8. (Withdrawn) A method according to claim 1, wherein the spinel is magnesia-alumina spinel.

9. (Currently Amended) A vibration-damped structure comprising a metallic substrate and a vibration damping coating applied to said substrate by plasma spraying, wherein the coating ~~comprising~~ comprises

_____ a spinel having regions of ~~relative oxide or nitride imbalance~~ oxide or nitride that vary from a stoichiometric spinel ratio, or regions of oxide and nitride that vary from a stoichiometric spinel ratio,

_____ calcium oxide, and

_____ said spinel further characterised by the presence of at least about 85,000 effective interface and defect zones per surface square millimetre, or at least about 100,000 orientated grain boundaries and microcracks per surface square millimetre, or both.

10. (Original) A structure according to claim 9, which comprises an aerospace component or a portion thereof.

11. (Currently Amended) A ~~structure according to a~~ vibration-damped structure comprising a metallic substrate and a vibration damping coating applied to said substrate by plasma spraying, wherein the coating ~~comprising~~ comprises

_____ a spinel having regions of ~~relative oxide or nitride imbalance~~ oxide or nitride that vary from a stoichiometric spinel ratio, or regions of oxide and nitride that vary from a stoichiometric spinel ratio,

_____ calcium oxide, and

~~_____ said spinel further characterised by the presence of~~ at least about 85,000 effective interface and defect zones per surface square millimetre, or at least about 100,000 orientated grain boundaries and microcracks per surface square millimetre, or both, ~~_____ when wherein the vibration-damped structure is produced by a method~~ according to claim 1.

12. (Withdrawn-Currently Amended) A particulate spinel material ~~wherein at least some of the particles have a relative oxide or nitride imbalance with respect to other ones of the particles, or wherein at least some of the particles have regions of relative oxide or nitride imbalance within the particle, or both.~~ comprising (1) at least one particle having oxide or nitride that varies from a stoichiometric spinel ratio within the particle, or at least one particle having regions of oxide and nitride that vary from a stoichiometric spinel ratio within the particle, (2) calcium oxide, and (3) at least about 85,000 effective interface and defect zones per surface square millimetre, or at least about 100,000 orientated grain boundaries and microcracks per surface square millimetre, or both.

13. (Withdrawn-Currently Amended) A particulate spinel material according to claim 12, ~~wherein the relative oxide or nitride imbalance~~ the at least one particle having oxide or nitride that varies from a stoichiometric spinel ratio within the particle, or the at least one particle having regions of oxide and nitride that vary from a stoichiometric spinel ratio within the particle is provided by a precursor of an oxide or nitride, respectively, which precursor is capable of being converted to an oxide or nitride in ~~the coating~~ a coating application method.

14. (Withdrawn) A particulate spinel material according to claim 13, wherein calcium carbonate is present as a precursor of calcium carbonate.

15. (Withdrawn-Currently Amended) A particulate spinel material according to claim 12, which ~~consists essentially of the~~ comprises said particles, optionally together with particles of stoichiometrically balanced spinel material.

16. (Withdrawn-Currently Amended) A particulate material according to claim 12, wherein the particles are sufficiently fine to melt in a plasma flame during ~~the process a~~ process of application to coat a metallic ~~substrates~~substrate.

17. (Withdrawn-Currently Amended) A particulate material according to claim 12, wherein the particles are in the form of particulate agglomerates of smaller particles which can disintegrate or fragment in a plasma flame during ~~the process a~~ process of application to provide in the flame a stream of molten particles for ~~the application of the~~ coating to the substrate an application of a coating to a substrate.

18. (Withdrawn) A particulate material according to claim 12, in the form of a dry powder.

19. (Withdrawn) A particulate material according to claim 12, comprising in admixture a first particulate spinel material in which one of the oxides of the spinel and/or an introduced oxide and/or nitride is in a molar excess and a second particulate spinel material in which the other of the oxides of the spinel and/or an introduced oxide and/or nitride is in a molar excess, optionally together with further particulate spinel materials of different composition whether stoichiometrically balanced or unbalanced.

20. (Withdrawn-Currently Amended) A particulate material according to claim 19, ~~consisting essentially of the~~ comprising said particulate spinel materials.

21. (Withdrawn) A particulate material according to claim 12, comprising particles comprising internal domains of a first spinel material in which one of the oxides of the spinel and/or an introduced oxide and/or nitride is in a molar excess and a second spinel material in which the same oxide is present in a different molar excess or the other of the oxides of the spinel and/or an introduced oxide and/or nitride is in a molar excess, optionally together with further spinel domains of different spinel composition whether stoichiometrically balanced or unbalanced.

22. (Withdrawn-Currently Amended) A particulate material according to claim 21, ~~consisting essentially of the~~ comprising said particles.

23. (Withdrawn-Currently Amended) A particulate material ~~according to a particulate having a spinel material wherein at least some of the particles have a relative oxide or nitride imbalance with respect to other ones of the particles, or wherein at least some of the particles have regions of relative oxide or nitride imbalance within the particle, or both,~~ comprising (1) at least one particle having oxide or nitride that varies from a stoichiometric spinel ratio within the particle, or at least one particle having regions of oxide and nitride that vary from a stoichiometric spinel ratio within the particle, (2) calcium oxide, and (3) at least about 85,000 effective interface and defect zones per surface square millimetre, or at least about 100,000 orientated grain boundaries and microcracks per surface square millimetre, or both, for use in a method according to claim 1.

24-29. (Canceled).

30. (New) A process of damping vibrations in a metallic substrate comprising coating the metallic substrate with a spinel material, wherein the spinel material comprises

at least one particle having oxide or nitride that varies from a stoichiometric spinel ratio within the particle, or at least one particle having regions of oxide and nitride that vary from a stoichiometric spinel ratio within the particle,

calcium oxide, and

at least about 85,000 effective interface and defect zones per surface square millimetre, or at least about 100,000 orientated grain boundaries and microcracks per surface square millimetre, or both.